

Fig. 1

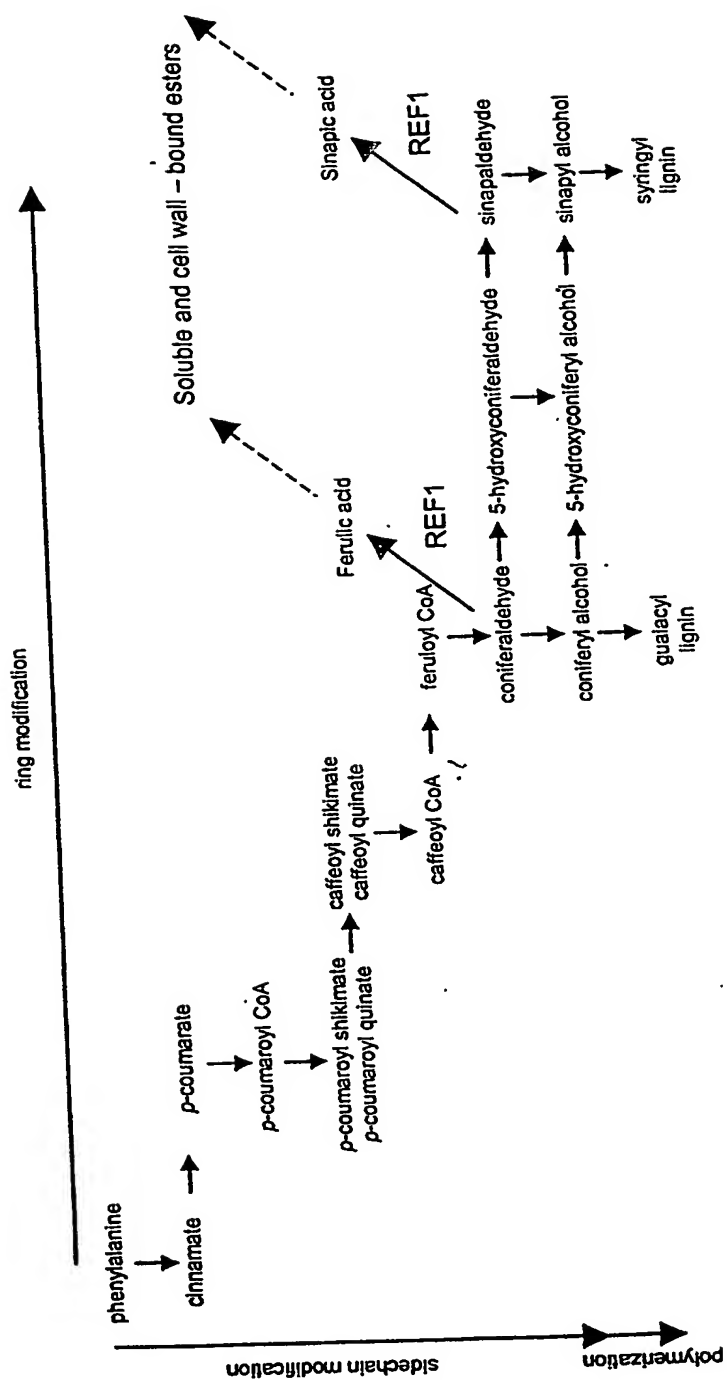


Fig. 2

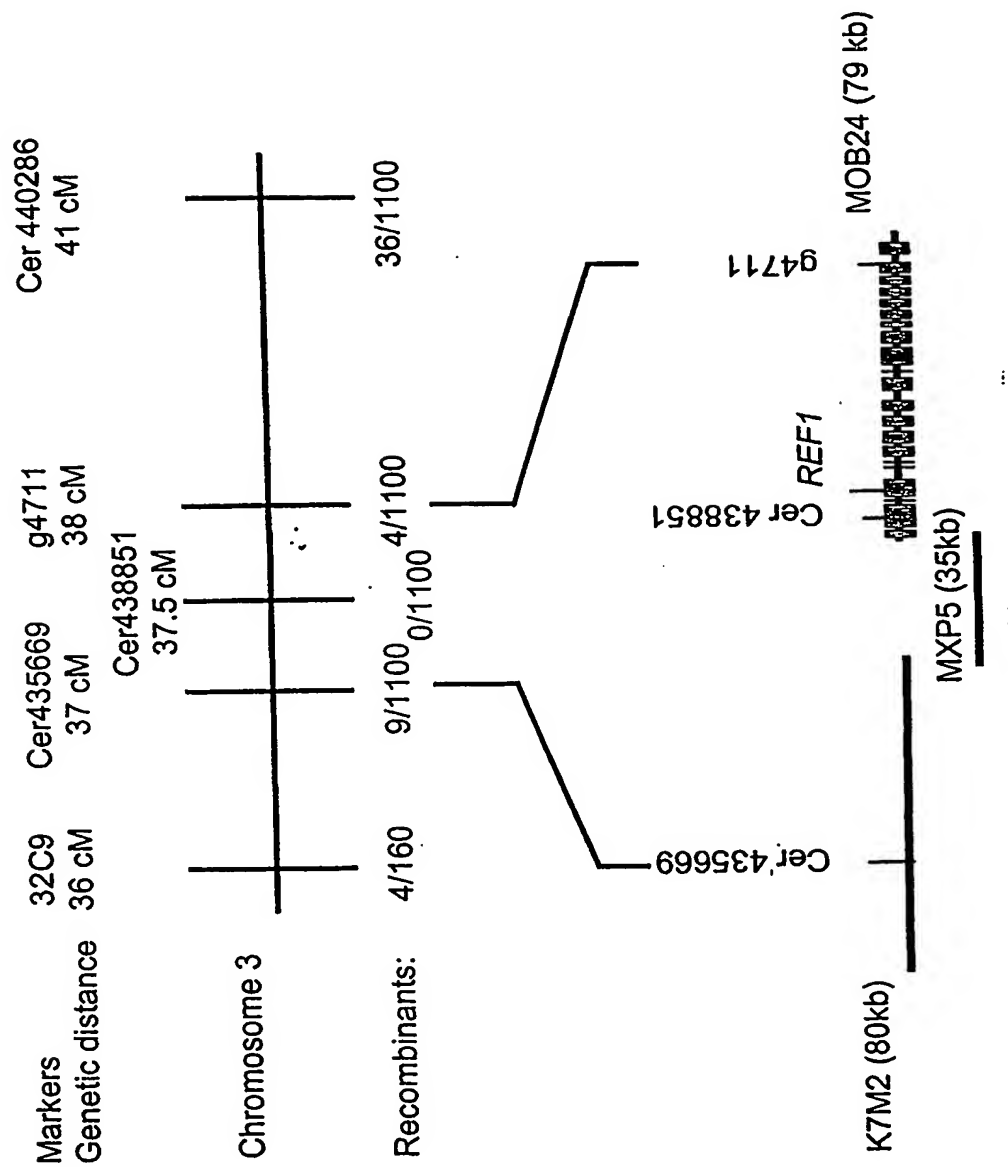


Fig. 3

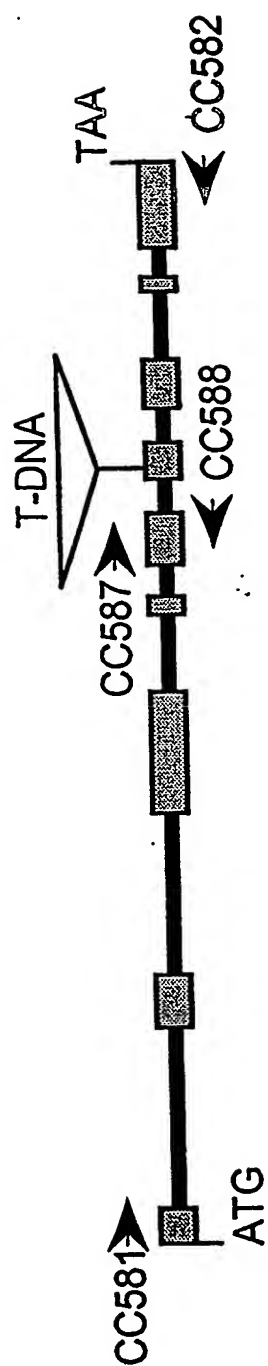


Fig. 4**At REF1 nucleic acid and amino acid sequences****Panel A**

Arabidopsis REF1 EST sequence (SEQ ID NO:1)

Skibbe et al., AtALDH1a
Vasilou classification # ALDH2C4

(EST clone Gene bank ID # T43357) 1625 bp

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CCACGCGTCCGAGAGAGAGAGAGAATTACAAAGAAAAATAAATGGAGAACGGCAAATGCAACGGAGC
CACGACGGTGAAGTTACCGGAGATCAAATTCACCAAGCTTTTCATCAACGGCCAGTTCATTGATGCTGCT
TCAGGGAAGACGTTTGAGACGATAGACCCTAGGAACGGTGAAGTGATCGCAACAATAGCCGAAGGAGAC
AAAGAAGACGTTGACTTGGCCGTTAACGCTGCACGTTACGCCTTCGACCATGGTCCTTGGCCTCGCATGA
CCGGCTTCGAGAGGGCAAAGCTTATAAACAATTCGCAGACTTAATAGAGGAAAACATTGAAGAATTGGC
TAAACTTGATGCGGTTGACGGTGGAATTTGTTCCAATTGGGGAAATATGCTGATATCCGGCCACAGCC
GGTCATTTTCGATACAATGCGGGTGCAGCGGATAAAATCCACGGCGAGACTCTTAAAATGACGCGTCAAT
CGTTGTTTGGATACACCCTCAAAGAACCAATTGGAGTGGTTGGTAATATCATCCCTTGAATTTCCAAG
CATTATGTTTGCACAAAGGTAGCTCCGGCTATGGCTGCTGGTTGCACCATGGTGGTCAAGCCAGCTGAa
CAGACTTCACTCTCTGCTTTGTTCTATGCCATCTCTCAAAGAAGCGGGAATTCCTGATGGTGTGCTCAA
CATTGTAAGTGGTTTTGGATCAACTGCTGGAGCTGCCATTGCCTCCCATATGGACGTAGACAAAAGTTAGT
TTCACTGGGTCAACAGATGTTGGAAGGAAGATAATGCAAGCCGAGCCGCAAGTAATCTCAAAAAAGTTT
CCCTTGAATTAGGCGGGAAATCGCCACTTCTCATATTCAACGACGCTGATATTGACAAAGCCGCCGATCT
TGCGCTTCTCGGTTGCTTTTACAACAAGGGTGAAATTTGCGTGGCGAGCTCTCGTGTGTTTGTTCAGAA
GGTATATACGATAAGGTTGTGGAGAAGTTAGTAGAGAAGGCTAAAGATTGGACCGTTGGTGATCCTTTT
GATTCCACTGCTCGACAAGGACCTCAAGTGGATAAAAGACAGTTTGAGAAGATTCTATCTTACATTGAGC
ACGGTAAAAACGAAGGAGCGACCTTATTAAGTGGAGGAAAAGCCATTGGAGACAAAGGATATTTTCATCCA
ACCAACTATATTCGCAGATGTCACTGAGGATATGAAGATATACCAAGATGAAATCTTGGACCAGTCATG
TCACTGATGAAATTCAAGACGGTAGAGGAAGGGATCAAATGCGCAAACAACACGAAATACGGTCTTGCAAG
CAGGAATACTAAGCCAAGACATAGACTTGATCAACACGGTTTCGAGGTCAATCAAAGCTGGAATCATTTG
GGTTAATTGCTACTTCGGGTTTGATCTTGACTGTCCTTATGGTGGCTACAAGATGAGTGGTAATTGTCGT
GAAAGTGGCATGGACGCTCTCGACAACATCTACAAACCAAATCCGTCGTTATGCCTCTTCACAATCCCC
TTGGATGTAATAAAATTGTCCATAACACATAGAAAAAACTTAATCCAATGATAATAAGGCGGCTTGAATT
AAAAAAAAAAAAAAAA
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Fig. 4, continued**Panel B**

Arabidopsis REF1 open reading frame sequence (1506 bp) (SEQ ID NO:2)

atggagaacggcaaatgcaacggagccacgacggatgaagtaccggagatcaaattaccaagctttcatcaacggccagttcattgat
gctgcttcagggaagacggttgagacgatagaccctaggaaacggatgaagtatcgcaacaatagccgaaggagacaaagaagacgtt
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attccggccacagccggtcattttogatacaatgcgggtgcagcggataaaatccacggcgagactctaaatgacgcgtcaatcgttgt
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ctatggctgctggttgacccatgggtggtcaagccagctgaacagactcactctctgctttgtctatgccatctctcaaaagaagcgggaa
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ggcttcgacgaggaataactaagccaagacatagacttgatcaacacggttcogaggtcaatcaaagctggaatcatttgggttaattgct
acttcgggttgatcttgactgtccttatggtggctacaagatgagtggaattgctgtaagtggtgcatggacgctctcgacaactatctac
aaaccaaatccgttgttatgctcttcacaattccccttgatgtaa

Panel C

Arabidopsis REF1 protein sequence (501 amino acids)

Skibbe et al., AtALDH1a

Vasilou classification # ALDH2C4

MENGKCN GATTVKLPEIKFTKLFINGQFIDAASGKTFETIDPRNGEVIATIAEGDKEDVDLAVNAARYAFDHG
PWPRMTGFERAKLINKFADLIEENIEELAKLDAVDGGKLFQLGKYADIPATAGHFRYNAGAADKIHGETLKMT
RQSLFGYTLKEPIGVVGNIPWNFPSIMFATKVPAMAAGCTMVVKPAEQTSLSALFYAHLKSKEAGIPDGLNI
VTGFGSTAGAAIASHMDVDKVSFTGSTDVGRKIMQAAAAANLKKVSLELGKSPLLIFNDADIDKAADLALLG
CFYNKGEICVASSRVFVQEGYDKVVEKLVEKAKDWTVGDPFDSTARQGPQVDKRQFEKILSYIEHGKNEGA
TLLTGGAIGDKGYFIQPTIFADVTEDMKTYQDEIFGPVMSLMKFKTVEEGIKCANNTKYGLAAGILSQDIDLI
NTVSRSIKAGIIWVNCYFGFDLDCPYGGYKMSGNCRESGMDALDNYLQTKSVVMPLHNSPWM

Fig. 5**REF1 Homologs from Other Plants**

Arabidopsis REF1 Homolog At1g23800

Skibbe et al., ATALDH2b
Vasilou classification # ALDH2B7

(Gene bank ID AY113912) 1636 bp

atggcatcaa gaagagtttc ttgctgctc tctcgctctt tcatgtctc ctacgttct
atcttctctc ttgaggcat gaacagagga gctcaaagat acagtaacct cgctgctgct
gtcgaaaaca ctattactcc accagtgaag gttgaacaca cacagcttct aatcgggtgga
agattcgttg atgcagtgctc agggaaaaact ttcctactt tggatccaag aaatggagaa
gtgattgctc aagtgtctga aggtgatgca gaagacgtga accgcgcggg tgcagctgca
cgaaaggctt ttgatgaagg accatggcct aaaatgacag cttatgagag atcaaagata
ctgtttcgtt tgcgtgattt aatcgagaaa cataatgatg agattgctgc tcttgagact
tgggataatg ggaaacctta tgaacaatct gctcaaattg aagtaaccaat gcttgctagg
gtgttcgggt actatgctgg ttgggcagac aagatacatg gaatgacaat gccaggagat
ggccacacacc atgtgcagac cttacatgag cctataggag tgcctggaca aatcatcca
tggaaactcc ctcttctcat gctttcttgg aaacttggac cagcttagc ttgcggtaac
accgttgctc tcaaaactgc tgagcaaaact cctctatctg ctcttctgt tgggaaacta
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gatgttggga agattattct tgagttagct tcaaaaagca accttaaggc agtgactct
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acattgtac atgaacgtgt gtatgatgag tttgtagaga aagctaaagc tctgcactc
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gttgggactg ttggatcaa ctgtttgat gtactgatg catcaattcc atttggaggg
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gtcaaggctg ttgtacttc cctcaagaac cctgcctggc tctaaccat accaggtgg
tacacttatt tctcga

ALDH2b (ALDH2B7)

Skibbe et al., ATALDH2b
Vasilou classification # ALDH2B7

(Gene Protein ID # AAG42016)

Fig. 5, continued

MASRRVSSLLSRFSMSSSRISIFSLRGMNRGAQRYSNLAAVENTITPPVKVEHTQLLIGGRFVDAVS
GKTFPTLDPRNGEVIAQVSEGDAEDVNRAVAAARKAFDEGPWPKMTAYERSKILFRFADLIEKHND
IAALETWDNGKPYEQSAQIEVPMLARVFRYYAGWADKIHGMTMPGDGPHHVQTLHEPIGVAGQIIP
WNFPLMLSWKLGPAACGNTVVLKTAEQTPSALLVGKLLHEAGLPDGVVNIVSGFGATAGAAIAS
HMDVDKVAFTGSTDVGKIILELASKSNLKAVTLELGGKSPFIVCEDADVDQAVELAHFALFFNQGC
CCAGSRTFVHERVYDEFVEKAKARALKRNVGDPFKSGIEQGPQVDSEQFNKILKYIKHGV EAGATLQ
AGGDRLGSKGYIQTPTVFSVDKDDMLIATDEIFGPVQTILKFKDLDEVIARANN SRYGLAAGVFTQNL
DTAHRMLRALRVGTWVINCVDLDASIPFGGYKMSGIGREKGIYSLNNYLQVKAVVTS LKNPAWL

Fig. 5, continued

Arabidopsis REF1 Homolog Tair At3g48000

Skibbe et al., AtALDH2a

Vasilou classification # ALDH2B4

(Gene bank ID AF327426) 1854 bp

agaggaggag aattcgaaga ataaaagata agaacttga cgtttgaag cttaaagctt gaaactgtt tcatcatgg
 cggctogtag agtgtcttct ctttatctc gatcttttc agcttctct ccctactgt ttogttctca agggagaaat
 tgttacaatg gagggatctt aaggagattt ggaacctct ctgctgtgc tgaggaaatc ataaacccat ctgttcaagt
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 aatgagtgct tatgaaaggc caagagtttt gttgaggtt gcagatttg ttgagaaaca
 cagcgaagag ctgcgtctc tagagacatg ggacaatggc aagcctacc aacaatcct
 gaccgcagag attccatgt ttgcaagatt gttcgttac tatgtggat gggcggataa
 gattcatgga ctaacaattc cagctgatgg aaactatcaa gttcacacat tacatgaacc
 gataggtgta gctggacaga tcataccgtg gaattttcca ctttgatgt ttgcttgaa
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 ttgtgatact tctaataat ttttcattgt tgtttattca aaaaaaaaaa aaaa

ALDH2a (ALDH2B4)

Skibbe et al., AtALDH2a

Vasilou classification # ALDH2B4

(Gene bank Protein ID AF327426) 538 amino acids

MAARRVSSLLSRFSASSPLLFRSQGRNCYNGGILRRFGTSSAAEEIINPSVQVSHQTLLINGNFVD
 SASGKTFPTLDPRTGEVIAHVAEGDAEDINRAVKAARTAFDEGPWPKMSAYERSRVLLRFADLVEKH
 SEELASLETWDNGKPYQQLTAEIPMFARLFYAGWADKIHGLTIPADGNYQVHTLHEPIGVAGQI
 IPWNFPLLMFAWKVGPALACGNTIVLKTAEQTPLTAFYAGKLFLEAGLPPGVLNIVSGFGATAGAALA

Fig. 5, continued

SHMDVDKLAFTGSTD TGKVLGLAANSNLKPVTLLEGGKSPFIVFEDADIDKAVELAHFALFFNQGC
CCAGSRFTVHEKVYDEFVEKSKARALKRVVGDPPFRKGIEQGPQIDLKQFEKVMKYIKSGIESNATLEC
GGDQIGDKGYFIQPTVFSNVKDDMLIAQDEIFGPVQSILKFSDVDEVIKRANETKYGLAAGVFTKNLD
TANRVSRALKAGTVVWVNCDFVDAAPFGGYKMSGNGREKGIYSLNNYLQIKAVVTALNKPawi

Fig. 5, continued

Rice REF1 Homolog

Skibbe et al., OsALDH1a
Vasilou classification # ALDH2C1

(Rice Accession # AB037421) 1751 bp

aactccaat ttctctctc acatctctt gtgtttctt tatttctct ctgctcgog
 61 cgatggcggc ggcgaacggc ggcgacagca aggggttoga ggtgcgaag ctggagatca
 121 agttcaccaa gctctcatc aatggccgct tcgtcgacgc cgtctcggc aagacattcg
 181 aaaccctga cccgcgcacc ggcgaggtca tcgccaagat cgcgaagga gacaaggccg
 241 acatcgacct cgcgtgaag gccgccaggg aggccttoga ccatggccc tggccaagaa
 301 tgtccgctt tgcgagggga aggatcctgc acaagttcgc ggacctggtg gagcagcaog
 361 tggaggagct ggcggcgctg gacacggtgg acgccggcaa gctgttcog atggggaagc
 421 tcgtcgacat cccggcggc gcgaacctgc tcgggtacta cgcggcgog ggcgacaagg
 481 tgcacggcga gacgtcaag atggcgcggc catgccacgg gtacacgctc aaggagoccg
 541 tcggcgtgt cggccacatc gtgccgtgga actacccac caccatgtt ttctcaagg
 601 ccagcccgcc gctcgccgc ggctgcacca tggctgtcaa gcccgccgag cagaccccc
 661 tctcgcgt ctctacgcc cactcgcca agcttgccg cgtcccgac ggcgtgctca
 721 acgtgtccc cggctcggc cccaccgccc gcgcgctat ctctccac atggacattg
 781 acaaggtag ctacccggc tcgacggagg tcggccggt ggtgatggag gcggcgoga
 841 agagcaacct gaagccgct tcgtcgagc tgggtggcaa gtctcggtc atcgtgtcg
 901 acgacgcga cctcgacac gccgtgaacc tggccacat ggctctac accaacaagg
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 1081 ttcatcaagg cctcagatt gacaaggagc aatacgagaa gatctcaag tacatcgaca
 1141 tcgtaagcg cgaaggcgc acgttggtca cggaggga gcoctcgcc gaaaacgggt
 1201 actacatga gccaccatc ttacggacg tcaaggaaga aatgtcgatc gcgcaagagg
 1261 aaatctcgg gcggtgatg gcctcatga aattcaagac ggttagggag gcgatccaga
 1321 aggcgaacag ccccggtac ggctggctg ccggcatagt caocaagaac atcgacgtog
 1381 cgaacacggt ttgcggctg atccgggac gggcaatct gatcaattgc tacctcggct
 1441 tcgacccga cgtccgctc ggggggtaca agatgagcgg ctccggcaag gacatgggca
 1501 tggacgccct tgagaagtac ctccacacca aggcggtggt caccctctc tacaacacc
 1561 cttggtatg atctgatg gaacagcaca gaaagattaa ttacagtga aaaaaataac
 1621 atttctat atacagctga aagggtgggt tatattgtg gtagtgtat tgctgtatc
 1681 aaatatcaat ttgcggaat aaagacagta tatttcagtt aaaaaaaaa aaaaaaaaaa
 1741 aaaaaaaaa a

Skibbe et al., OsALDH1a
Vasilou classification # ALDH2C1

(Rice Gene Bank protein ID BAA96794) (cytosolic) (67% identity)

maaanggdsk gfevpkleik ftklfingrf vdavsgktfe trdprtgevi aklaegdkad
 61 idlavkaare afdhgpwprm sgfargrilh kfadliveqhv eelaaltdvd agklfamgkl
 121 vdipgganil rryagaadv hgetlkmarp chgytlkepv gvvghivpwn ypttmffika
 181 spalaagctm vvkpaetpl salfyahlak lagvpdgvn vvpfgptag aaissmldid
 241 kvsftgstev grlvmeaaak snlkpvslei gkspvifd dadldtavn vmasytnkg
 301 elcvagsriy vqegydafr kkatemakks vvgdpfnprv hqgpqidkeq yekillyidi
 361 gkregativt gkpcgengy yleptftdv keemsiaqee ifgpmalmk fktveeaiqk

Fig. 5, continued

421 anstryglaa givtknidva ntvrsirag aiwincylgf dpdvpfggyk msgfgkdmgm
481 dalekylhtk avvtplyntp wl

Fig. 5, continued

Rice Mitochondrial REF1 Homolog

Skibbe et al., OsALDH2a
Vasilou classification # ALDH2B5

(GB # AB030939) 1855 bp

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tgcagcttat catggcgga aggagggtg ctctccct cctctctgc ggctcatcg
 61 cgaggccttc tgctgcttc tccactggg actcogctat ccttgagca ggctcagcac
121 ggggcttctt gctggatca cttcacagat tcagcgctgc accggcgcc gctgccaccg
181 ccgagccac tgaggagccg atccagccgc cggtgagct gaagtacacc aagctctca
241 tcaatggcaa cttcgtgat gcagcatctg ggaagacgtt cgcgacggtg gatccccga
301 ccggcgatgt cattgccgc gtggccgagg gcgacgcgga ggacgtcaac cgcgcgctg
361 ccgcccgcg ccgggcttc gacgaggcc cgtggccgc gatgaccgc tacgagcgtt
421 gcagggtgtt gctgcggtc gcggacctga tcgagcagca cgcgcatgag atcgcgcgc
481 tgagagcgtg ggacggcggg aagacgttg agcagacgac ggggacggag gtgcgatgg
541 tggcgcgta catcggtac tacggcgggt gggcggaaca gatccaaggc ctgctcgtc
601 cggcgatgg gccacaccac gtgcaggtgc tacacgagcc catcgcgctg gcggggcaga
661 tcatccctg gaactcccg ctgctcatgt tcgctggaa ggtcgcccg gcgctcgct
721 gcggcaacgc cgtgtgctc aagaccgcg agcagacgc gctctccgc ctctctgctg
781 ccagctgct ccagaggct ggctcccg accggtct caacgtgct tcggccttg
841 gtccgaccgc cggcgccgt ctctcagcc acatgggtg gcacaagctt gcattcacg
901 gttcgacggg caggggcaag atcgtgctg agtcggccg aaggagcaac ctaagccg
961 tgacgtgga gctcgaggc aaatcacctt tcactgcat ggatgacgc gatgtgacc
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1081 ggtcacgcac gttcgtcac gagcgcgtt acgacgagtt cgtggagaag gccagggtc
1141 gcgctcga gcgtgtggtc ggcgacccat tcaggacagg cgtcgagcag gggcctcaga
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1261 ccactcgtt ggccggcgc gacaggcgc gcagcgggg gttctacatc cagccaaccg
1321 tcttgcaga cgtcgaggac gaaatgaaga tcgcgagga ggagatattc gggccggtg
1381 agtccatct caagtgcgc accgtggagg aggtggtgc gagggcgaa cgcagccat
1441 accggctggc gcgggggtg ttaaccaga ggctggacgc ggcgaacac ctggcgcg
1501 cattgagggt cgggacggtg tgggtgaaca ctaacgagc gttcgacgc gccgtccgt
1561 tcggcggtc caagatgagc ggcgttgga gggagaagg cgtctacgc ctccgaact
1621 acctcagac caaggcgtc gtcacgcca tcaaggacgc cgcctggtg tagctgagt
1681 aatcgatct tctctctc catcccatc gccattgct cgtgctatga ctgctatcc
1741 gtgctctcc atatcagtg tcaattgtc gcgtgatgc tctgaacaac gccagagatt
1801 gcgatgaata atggttaaat cgggcaatct ttgtacaaa aaaaaaaaaa aaaaa

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Skibbe et al., OsALDH2a
Vasilou classification # ALDH2B5

(GB # BAA96793) 553 amino acids

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maarraassl lsrgliarps aasstgdsal lgagsargfl pgsllrfsaa paaaataaat
 61 eepiqppvdv kytkllngn fvdaasgktf atvdprtgdv larvaegdae dvnrvavaar
121 rafdegpwpv mtayercrvl lrfadlieqh adeiaaletw dggktleqtt gtevpmvary
181 mryyggwadk lghlvpadg phhvqvlehp igvagqilpw nfpilmfawk vgpalcagna

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Fig. 5, continued

241 wlktaeqtp lsalfvasll heaglpdgvi nvsgfgpta gaalsshmgv dklaftgstg
301 tgkivlelaa rsnlkpvtle lggkspfivm ddadvdqave lahralfnq gqcccagsrt
361 fvhervydef vekararalq rvvgdpfirtg veqgpqidge qfkkilqyvkg sgvdsगतiv
421 aggdragsrg fyiqptvfad vedemkiaqe eifgpvqsil kfstveevr ranatpygla
481 agvftqrlda antlaralrv gtwwntydv fdaavpfggy kmsgvgrekg vyslmylqt
541 kavvtpikda awl

Fig. 5, continued

Rice Mitochondrial REF1 Homolog

Skibbe et al., OsALDH2b
Vasilou classification # ALDH2B1

(GB # AB044537) 2115 bp (61% identity to REF1)

CAAAGCAAAGCCGCCATTACTGCTCCTCTTCCATTCCACTGGGGACGTACGAGCTCCGCGCATCC
 CTTCCATTCCATTACTGACCTTGGCTGCTGCGGCTGCAGTGCAGAGGGGGTTTGGTGGTGCGGT
 TGATTTGAGCAATAAATTCTCTAGGGGGGAGGGAGGTATCGGTATGGCTGCCGCTGCTGCAAG
 GAGGGGCTCATCGCTGCTCTCGCTGCCTGTCCAGGCCCGCCGCCGCGCTCGCCTGCT
 GTCCCTCTGCGCTCCGCAGGGCAGATGGGACACAAGGATTGTTGCCGGAATCCTTCAGAGGT
 TCAGCACTGCAGCAGTAGCAGAGGAGCCCATATCACCCCACTCCAAGTGAAGTCACTCAGCTC
 CTCATTGATGGAAAATTCGTTGATTTCAGCATCTGGCAAACTTTCCCACTCTGGACCCTCGTAC
 CGGGGAGCTGATTGCCCATGTGGCTGAAGGCGATGCGGAGGATATTAACCGTGCGGTTTCATGCG
 GCCCGCAAGGCTTTCGATGAAGGGCCATGGCCAAAGATGACTGCCTATGAGAGATCCCGGATTC
 TGTTCGCGTTTGTGACTTGATTGAGAAGCACAACGATGAAATTGCTGCATTGGAGACATGGGA
 CAACGGCAAGCCGATGCGCAAGCTGCCAACATTGAAGTGCCAATGGTGGCACGGCTGATGCGG
 TACTATGCTGGTTGGGCTGACAAGATCCATGGGCTTGTGCTGCCGGCTGACGGCCACACCATG
 TACAGGTGCTGCACGAGCCATTGGTGTGCGAGGTGAGTATCCCATGGAATTTCCGCTTCTG
 ATGTTTGCCTGGAAAGTTGGCCCTGCTTTGGCTTGTGGAAACACTGTTGTGCTCAAGACGGCTG
 AGCAAACTCCTCTGCTGCTCTATTTGCTTCTAAGCTGTTGCATGAGGCTGGACTCCAG
 ACGGTGTTGTTAACGTGGTATCTGGTTTTGGACCTACTGCTGGTGTGCTCTTGCTAGTCACATG
 GATGTCGATAAGATTGCATTCACTGGATCGACCGATACTGGAAAAGTCGTCCTTGAGTTGGCTGC
 AAGGAGCAACCTTAAGTCAGTGACACTGGAGCTAGGAGGCAAGTCTCCTTTCATCATCATGGATG
 ATGCTGATGTTGACCATGCTGTTGAGCTTGCGCATTTTGCACTGTTCTTTAACCAGGGACAATGT
 TGCTGTGCTGGGTCTCGTACATTTGTGCATGAGCGTATCTATGATGAGTTTCGTGGAGAAGGCCA
 AGGCTCGTGCTCTCAAGCGTGTGGTTGGTGATCCATTCAAGAATGGTGTGACAGGGGCCCTCA
 GATTGATGACGAGCAATTCAACAAGATCTTGCCTACATCAAGTATGGTGTGACAGTGGAGCCA
 ACCTTGTGACTGGTGGCGACAGATTAGGTGACAAAGTTACTACATCCAGCCAACAATTTCTCG
 GATGTACAGGATAACATGAGGATTGCTCAAGAAGAGATATTTGGCCCTGTGCACTCCATTCTGAA
 GTTCAATGATCTGAACGAGGTGATCAAGAGGGCAAATGCAAGCCAGTACGGGCTGGCTGCTGGG
 GTCTTCAACAACAACCTGAACACGGCCAAACCCCTGACCCGCGCGCTCAGGGTCGGGACCGTGTG
 GGTGAACCTGCTTCGACGCTCTTCGACGCCGCGATCCCGTTGCGCGGATACAAGCAGAGCGGCATC
 GGGAGGGAGAAGGGCATCGACAGCCTGAAGAACTACCTGCAGGTCAAGGCCGTGTCACGCCGA
 TCAAGAACGCCGCGTGGTTGTAAACACATAGATGTTTGGACATTTCAGAACTGGGGAAGAAATAG
 GTATAATCTTATGGACGGATGCGAAAATGGCGATAAATTATGGCGATAAGATTATGATGATGATG
 ATGAAGAAGAAGAAGAGGAGGAGGAAGAAGAGCTGAAATAAGCTTGTCTAGCATGGGGCTGGC
 ATTGTCTCTAATAAACCTTGTGGTTGGTGCTCATGTTACTGATGGA
 GTATATTGTAGAAGCAGATTTATGTTTCATTATGAAATATATATCGCTTGTGGGATAAAAAAAAAA
 AAAAAAAAAA

Skibbe et al., OsALDH2b
Vasilou classification # ALDH2B1

GB # BAB19052 (65% identity)

maaaaarrgs silsrclsr paaaaspavp salrradgtq glipgilqrf staavaeepi
 61 sppvqvnytg lldgkfvd asgkftptid prtgeliahv aegdaedinr avhaarkafd
 121 egpwpkmtay ersrllrfa dllekhndel aaletwdngk pyaqaaniev pmvarlmryy

Fig. 5, continued

181 agwadkihl vvpadgphhv qvlhepigva gqiipwnfpl lmfawkvga lacgntvvik
241 taeqtpisal faskliheag lpdgvvnvvs gfgptagaal ashmdvdkia ftgstdtgkv
301 vuelaarsnl ksvtelggk spfiimddad vdhavelahf alffnqqcc cagsrtfvhe
361 riydefveka karalkrvvg dpfkngvegg pqiddeqfnk ilryikygvd sganlvtggd
421 rlgdkgyyiq ptifsdvqdn mriaqeeifg pvqsilkfnd lnevikrana sqyglaagvf
481 tnnIntantl tralrvgtvw vncfdvfaa ipfggykqsg igrekgidsl knylqvkvav
541 tpiknaawl

Fig. 5, continued

Maize Cytosolic REF1 Homolog

Skibbe et al., RF2C

Vasilou classification # ALDH2C2

(GB# AF348413) (65% identity)

GC GGCCGCTGCACCTCCTTTCCACGACTCCCGAGCGCTCTGCGTGTGGCGCGCGGCAGCATGG
CGACTGCGAACGGGAGCAGCAAGGGGTCGTTGAGGTGCCAAGGTGGAGGTGAGGTTACCAA
GCTCTTCATCGACGGCAAGTTCGTCGACGCCGTCTCCGGCAAGACGTTGAGACCCGGGACCCT
CGCACCGGCGAGGTGATCGCCAGCATCGCGGAGGGAGGCAAGGCCGACGTCGACCTCGCCGTCA
AGGCCGCCGGGAGGCCTTCGACAACGGGCCCTGGCCAGGATGACGGGATACGAGCGTGGTC
GGATCCTCCACAGGTTGCGGGACCTGATCGACGAGCACGTGGAGGAGCTGGCGGCGCTGGACAC
GGTGGACGCCGGCAAGCTGTTGCGCGTGGGCAAGGCGCGGGACATCCCGGGCGCCGCGCACCT
GCTGCGCTACTACGCCGGCGCCGCCGACAAGGTGACGGCGCGACGCTCAAGATGGCGCAGCGG
ATGCACGGGTACACGCTCAAGGAGCCCGTGGGCGTGGTGGGCCACATCGTGCCCTGGAACCTACC
CCACCACCATGTTCTTCTTCAAGGTAGGGCCCGCGCTCGCCGCCGGCTGCGCCGTCGTCTGTAAG
CCCGCCGAGCAGACGCCGTGTCCGCGCTCTTCTACGCGCACCTCGCCAGGGAGGCCGGCGTCC
CAGCCGGCGTGCTCAACGTGTCGCGGGATTGCGGGCCACGGCCGGGGCCGCGCTCGCCGCCCA
CATGGACGTGACAAGGTGAGCTTACCGGGTCCACGGAGGTGCGCCGCCTCGTCATGAGGGCC
GCGGCCGAGAGCAACCTCAAGCCCGTGTGCTGAGCTGGGCGGCAAGTCTCCCGTCATCGTCT
TCGACGACGCCGACCTCGACATGGCCGTTAACCTCGTCAACTTCGCCACCTACACCAACAAGGGC
GAGATCTGTGTGGCCGGCACACGCATCTACGTGAGGAAGGGATCTACGACGAGTTCGTGAAGA
AGGCCGCCGAGCTCGCCAGCAAGTCCGTGGTCGGAGACCCGTTCAACCCGAGTGTGAGCCAGGG
CCCCCAGGTTGACAAGGACCAAGTACGAGAAGGTCTCAGGTACATTGACATCGGAAAGCGCGAA
GGCGCCACGCTGGTCACCGGAGGGAAGCCCTGCGGCGACAATAAGGGCTACTACATCGAGCCCA
CCATCTTCACGGACGTCAAGGACGACATGACGATCGCACAGGATGAAATCTTTGGGCCGGTGAT
GGCTCTCATGAAATCAAGACCGTGGAGGAGGTGATCCAGAAAGCGAACAACACCCGGTACGGC
CTGGCCGCCGCGCATCGTGACCAAGAACATCGACGTGCGCAACACCGTGTGCGCGTCCATCCGCG
CCGGCGCCATCTGGATCAACTGCTACTTCGCGTTGACCCCGGACGCGCCGTTGCGCGGGTACAA
GATGAGCGGGTTCGGCAAGGACATGGGCATGGACGCGCTCGACAAGTACCTGCAGACCAAGACC
GTCGTCACTCCGCTGTACAACACTCCATGGCTCTGACCGACCGACCTCTCATCTGTCCGATGAA
CAGTTCAACATCAAAACAAGAAGAAACATGTCTTGTAAGATACTCCTCAAAGGATCGGGTGCC
TGTAAGCTGTACTCTTACACCTGCATGGATTGATGTCTTGATGATGTAGTGCAATGTAGCATTGAG
AACAAATAAGACATGTTTCGGACTGC

Skibbe et al., RF2C

Vasilou classification # ALDH2C2

GB # AAL99609

MATANGSSKGSFEVVPKVEVRFTKLFIDGKFVDAVSGKTFETRDPRTEGEVIAEAGGKAD
VDLAVKAAREAFDNGPWPRMTGYERGRILHRFADLIDEHVEELAALDITVDAGKLFVVGKARDIPGAA
HLLRYYAGAADKVHGATLKMAQRMHGYTLKEPVGVVGHIPWNYPTTMFFFKVGPALAAGCAVVVK
PAEQTPLSALFYAHLAREAGVPAGVLNVVPGFGPTAGAAVAAHMDVDKVSFTGSTEVGRVLMRAAA
ESNLKPVSLELGGKSPVIVFDDADLDMAVNLVNFATYTNKGEICVAGTRIYVQEGIYDEFVKAAELA
SKSVVGD PPNPSVSQGPQVDKDQYEKVLRYIDIGKREGATLVGGKPCGDNKGYYIEPTIFTDVKDD
MTIAQDEIFGPVMALMKFKTVEEVIQKANNTRYGLAAGIVTKNIDVANTVSRIRAGAIWINCYFAFD
PDAPFGGYKMSGFGKDMGMDALDKYLQTKTVVTPLYNTPWL

Fig. 5, continued

Maize REF1 Homolog: cytosolic FR2D

Skibbe et al., RF2D

Vasilou classification # ALDH2C3

(GB # AF348415) (61% Identity)

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gcccttcgac tggagcaaga ggacactgac atggactgaa ggagtagaaa agagacgagt
 61 cgagtgaggg ggcagaggcc acaaaacaga gagtaccaa acgatcgatc tgtgcatctc
121 cccgtcgtc cogcaaccat ctaattcaga agcagacatc aatggcgagc aacggctgca
181 acggcaacgg caacggcaac ggcaacggca aggcggctcc ggcgggtgtg gtggtaccgg
241 agatcaagtt caccaagctc tcatcaacg gcgagttcgt cgacgcgcc tccggcaaga
301 cattcgatc cagggaacca cggacggcg acgtgctggc ccacgtagca gaggcagaca
361 aagctgatgt ggacctggcg gtgaagtccg ccggggacgc ctccgagcac ggcaagtggc
421 cccgatgtc aggtacgag cgcggcgga tcatgagcaa gctggcgac ctggtggagc
481 agcacaggga ggagctggcg gcgctggacg gtgcgacgc cgggaagctg ctgctgtgg
541 gcaagatcat cgacatccc gcggccacgc agatgctcg ctactacgc ggcgcgcgcg
601 acaagatcca cggcgacgtc ctgcgcgtc ccggcaggta ccagggtac acgtcaagg
661 agcctatcgg cgtcgtggcg gtcacatcc cctggaact cccaccatg atgttctcc
721 tcaaggtcag ccggcgctc gcgcgggct gcaccgtcgt cgtcaagccc gcgagcaga
781 cgcgcttc cgcgtctac tacgcgacc tcgcaaagat ggcggcgctc ccgacggag
841 tgatcaacgt cgtcccggg ttgcgccc cgcgcggcg cgcgtcgc tccacatgg
901 acgtgacag cgtggcctc aocggtcca cagaggtggg tcgctcacc atggagtccg
961 ccgcgggag caacctcaag aoggtctcg tggagctcg cggcaagtcg ccgctcatca
1021 tcttcgaga cgcgacgtc gacatggcg ttaacctgc gaggctgcc gtcttctca
1081 acaagggaga ggtttcgtg gcgggatcg gcgtgtact gcaggaagg atctatgacg
1141 agttcgtcaa gaaggcgtg gaggccgcg ggagctgaa ggtggagac ccgttcgatg
1201 tcaccagcaa catggccct caggttgaca aggaccagt tgagagggc taaagtaca
1261 ttgagcatg caagagcgag ggagcgact tgcacaccg cggcaagcct gccgcgaca
1321 aagggtacta cattgagccc accatcttg tcgatgtcac tgaggacatg aagatcgcg
1381 aggaagagat ctccgcccc gtcacgtccc tcatgaagt caagacggt gatgaggtga
1441 tcgagaagg caactgcac aggtacggc tcgcgcgg gatcgtgacc aagagcctg
1501 acgtgccaa ccgggtgtc cggcgtgtc gcgcggcac cgttggtg aactgtact
1561 tcgcttga ccggacgg cccttcggg ggtacaagat gagcggctc gccggggacc
1621 aggggctgc agcatggac aagtaactg aggtcaagag cgtcatcacc gcgtcccg
1681 actcgcatg gtactgagt gagccaggga ccgatggaac cccatcgatc tcttctgtg
1741 cagtgtacat gcgtcatcg tgcgtgtca cacagctgg ttgctgtt gtgctgtgt
1801 tcgtctctg ttgtggctc atgtgtgta gtctgcccc tatctctg tacgtagctg
1861 ccggacatgc aaatagtat taaagtacac catataaact ctgtttat aaattcaagt
1921 ttagcttga gcttctac cctcagct tg

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Skibbe et al., RF2D

Vasilou classification # ALDH2C3

(AAL99611)

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'MASNGCNGNGNGNGNGKAAPAGVVVPEIKFTKLINGEFVDAASGKTFDTRDPRTGDVLAHVAEAD
KADVDLAVKSARDAFEHGKWPRMSGYERGRIMSKLADLVEQHTTELAALDGADAGKLLLLGKIIDIP
AATQMLRYYAGAADKIHGDLRVSGRYQGYTLKEPIGVVGVIPWNFPTMMFFLKVSPALAAGCTVV
VKPAEQTPLSALYYAHLAKMAGVPDGVINVPVPGFGPTAGAAASHMDVDSVAFTGSTEVGRLIMESA

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Fig. 5, continued

ARSNLKTVSLELGGKSPLIIFDDADVDMAVNLSRLAVFFNKGEVCVAGSRVYVQEGYDEFVKKAVEA
ARSWKVGDPFDVTSNMGPQVDKDQFERVLKYIEHGKSEGATLLTGGKPAADKGYIEPTIFVDVTE
DMKIAQEEIFGPVMSLMKFKTVDIEKANCTRYGLAAGIVTKSLDVANRVSRSVRAGTVWVNCYFA
FDPDAPFGGYKMSGFGRDQGLAAMD KYLQVKS VITALPDSPWY

Fig. 5, continued

Maize REF1 Homolog: mitochondrial RF2A

Maize mitochondrial RF2A

Skibbe et al., RF2A

Vasilou classification # ALDH2B1

nucleotide (GB# U43082) (61% Identity)

CCCAAACCAATCCAAGCGCAAGAGGGGGCAAAGCCGCAAAGGGGGAGGCACCAGGCACCGGCA
GCCATTACTTACTGGTCTCACTCCACACCAACCAACCAACCTCCTCTGCCTGCCGCTTCTCCTG
CTGCGGGCGGGCACTGCTGCAAGTACTAGAGGAGGACATCCGCTTCCATTACTGCGCCTGCGGA
GGATCGGAGGAACCAAGTAGCGGAGGCTTCGATTTTCGGCGGGCGCAATAAATTTCCCGCATGGC
TCGGAGGGCCCGCTCCTCGCTCGTCTCCCGCTGCCTCCTGGCGAGGGCCCTGCCGGCGCGCCG
CCCGCTGCCCCCTCTGCGCCGCGCAGGACAGTGCCTGCAGATGGGATGCACAGGCTGTTGCCAG
GTGTCCTTCAGAGGTTTCAGCACTGCAGCAGCAGTAGAGGAGCCCATCACGCCGTCAGTCCATGT
GAACTACACAAAGCTCCTCATTAATGGGAACCTTGTGATTCCGCATCCGGCAAGACCTTCCAA
CTCTGGACCCTCGTACAGGGGAGGTGATTGCTCATGTGGCTGAGGGTGACGCAGAGGACATTAA
CCGTGCAGTAGCTGCGGCTCGCAAGGCTTTTGATGAAGGGCCATGGCCGAAGATGACTGCCTAT
GAGAGGTCCCGTATCCTACTGCGGTTTGCTGATTTGATAGAGAAGCACAAATGACGAGCTTGCTGC
TTTGAGACATGGGACAACGGGAAGCCATATGAGCAAGCAGCCCAGATTGAAGTACCCATGGTG
GCCGCTCTTATGCGTTACTATGCTGGTTGGGCTGATAAGATCCATGGGCTCATTGTGCCGGCTG
ATGGCCACACCATGTACAGATCTTGCAATGAGCCAATTGGTGTGCAAGTCAGATCATCCCATGG
AACTTTCCTCTTCTGATGTATGCCTGGAAGTTGGCCCTGCTTTGGCATGTGAAATACTCTCGT
GCTCAAGACTGCTGAACAAACCCCTCTATCGGCTTTGTATATCTCCAAATTGTTGCATGAGGCTG
GACTACCTGAGGGTGTTGTGAATGTCGTTTCTGGTTTGGCCCTACTGCTGGTGCTGCTCTTGCT
AGTCACATGGATGTTGATAAGATCGCATTACTGGATCTACCGATACTGGAAAAATTATTCTCGA
GTTGGCTGCAAGAGCAACCTTAAGACAGTGACACTGGAGTTAGGAGGCAAGTCCCCTTTCATCA
TAATGGACGATGCTGATGTTGACCATGCTGTTGAGCTTGCGCACTTTGCCCTGTTCTTAACCAG
GGACAATGCTGCTGCGCTGGATCTCGCACGTTTGATACATGAGCGTGTTTATGATGAGTTTGTGG
AGAAGGCCAAGGCTCGTGCAATTGAAGCGCGTCTGTTGGTGATCCGTTCAGGAAAGGTGTTGAACA
GGGCCCCGAGATTGACGACGAGCAATTCAACAAGATCTTGCGCTACATTAGGTATGGTGTGAC
GGTGGAGCTACCTTGTGACGGGTGGTGATAGGTTGGGTGACAAGGGTTTCTACATCCAGCCAA
CGATTTTCTCAGATGTCCAGGACGGCATGAAGATTGCTCAGGAGGAGATATTTGGGCTGTGCA
GTGATCCTCAAGTTCAAAGACCTCAATGAGGTTATCAAGAGGGCAAACGCGAGCCAGTATGGAT
TGGCCGCCGGCGTGTTACCAACAGCCTGGACACGGCCAACACCCTGACGCGCGCGCTCAGGGC
CGGGACCGTCTGGGTGAACTGCTTCGACGCTCTCGATGCTGCGATTCCGTTTGGTGGGTACAAG
ATGAGCGGCATCGGGAGGGAGAAGGGCGTTGACAGCCTGAAGAATACTGCAGGTGAAGGCG
GTCGTCACCCCAATCAAGAACGCCGCGTGTTGTAGACGCTGCAAGTGTGGCCTTGTGCACGAG
AACCACGTATATTCAATTCCTGGTCACATCCCCGAACAATGTGAAGGCGTTAATCAGATAGATGA
CGATGAAGAAGAACAATAAAGATTTGCCCTAGCCTGGGTTCTCAGTTATCTTAATAAGT
TTTATGGTTGGTGCCTATATATTGTGCAATTTGGTTGCTCCCTTTTATTTGTTTCTTTTGATAA
GACTGTTCTAGCAACGGATATGCAGAGTTCATTATGAAAATGCATTTGTTAGTGTCTTTGATGGT
TAA

Skibbe et al., RF2A

Vasilou classification # ALDH2B1

protein: (GB # AAC49371)

MARRAASSLVSRCLLARAPAGAPPAAPSAPRRTVPADGMHRLLPGLVLRFFSTAAAVEEPIITPSVHVN
YTKLLINGNFVDSASGKTFPTLDPRTEVIAHVAEGDAEDINRAVAAARKAFD

Fig. 5, continued

EGPWPKMTAYERSRILLRFADLIEKHNDLAALETWDNGKPYEQAQIEVPMVARLMRYYAGWADK
IHGLIVPADGPHHVQILHEPIGVAGQIIPWNFPLLMYAWKVG PALACGNTLV LKTAEQTPLSALYISK
LLHEAGLPEGVNVVSGFGPTAGAALASHMDVDKIAFTGSTD TGKI
ILELAAKSNLKT V TLELGGKSPFIIMDDADVDH AVELAHFALFFNQGCCAGSRTFVHE
RVYDEFVEKAKARALKRVVGD PFRKGVEQGPQIDDEQFNKILRYIRYGV DGGATLV TGGDRLGDKG
FYIQPTIFSDVQDGMKIAQE E IFGPVQSILKFKDLNEVIKRANASQYGLAAGVF
TNSLDTANTL TRALRAGTVWVNCFDVFDA AIPFGGYKMSGIGREKGVDSLKNYLQVKAVVTP IKNAA
WL

Fig. 5, continued

Maize REF1 Homolog: mitochondrial RF2B

Skibbe et al., RF2B

Vasilou classification # ALDH2B6

nucleotide (GB# AF348417) (59% identity)

AAGGCCATCGCTCTCCTAGCCTCGGAGACTTGCCCTTGCATACACATCCCCCGGAGGGCGGTGG
 CCGGAGCTGACCCCTGATCGGACGCGCTTAGCGCCTGAGGGCATGGCTGCAACCGTGAGGAGGG
 CTGCTTCCTCCGTCCTCTCTCGCTTCCTCCTCACAAAGCCTTCGCCTTCGCCTGCTTCTGCCGCCG
 GCAATAATTCGCTCTCCTCGGATCAGGGGCTGCTGCTTTCACAGGTTACGACCCGACCGGCA
 TCCGCGGCCGCGGCCGAGAGGCCGATCCAGCCGCGGTGGAGGTGAAGCACACCCAGCTCC
 TCATCAATGGCAACTTCGTCGACGCTGCTTCTGGGAAGACGTTCCCGACGCTGGACCCGCGCACC
 GGCGAGGTTCATCGCGCGCTCGCCGAGGGCGACAGCGAGGACATCGACCGCGCCGTGGCCGCC
 GCCCGCAGGGCCTTCGACGAGGGCCCGTGGCCGAGGATGACCGCCTACGATCGGTGCCGCGTGC
 TGCTGCGCTTCGCGGACCTGATCGAGCGGCACGCGGAGGAGTTCGCGGCGCTGGAGACGTGGG
 ACAACGGCAAGACGCTGGCGCAGGCGCGGGGGCCGAGGTGCCATGGTGGCGCGGTGCGTCC
 GGTACTACGCCGGCTGGGCGGACAAGATCCACGGCCTGGTGGCGCCGGCCGACGGCGCGCACCA
 CGTGACGGTGTGTCACGAGCCGGTGGCGGTGGCCGGCCAGATCATCCCTGGAACCTCCCGCTG
 CTCATGTTTCGCTGGAAGGTGGCCCCGGCGCTCGCCTGCGGCAACACCGTCTCCTCAAGACCG
 CCGAGCAGACGCCGCTCTCCGCGCTCTACGTGGCCAACCTCCTCCACGAGGCTGGGCTCCCCGA
 GGGTGTTCGAACGTGGTGTCCGGCTTCGGCCCGACGGCCGCGCAGCGCTCTCCAGCCACATG
 GGTGTCGACAAGCTTCGCTTCACGGGATCGACGGGCACGGGGCAGATCGTGCTCGAGCTGGCG
 GCGAGGAGCAACCTTAAGCCGGTGACGCTGGAGCTCGGTGGCAAGTCCCCTTTCATCGTCATGG
 ACGACGCCGACGTGACCAAGGCCGTGAGCTCGCGCACCAGGCGGTCTTCTTCAACCAGGGCCA
 ATGCTGCTGCGCCGGTTCGCGGACGTTCTGTCACGAGCGCGTGTACGACGAGTTCGTGGAGAAG
 TCCAAGGCCCGCGCCCTGAAGCGCGTCTCGGCGACCCCTTCAGGGACGGGGTGAACAGGGGC
 CTCAGATCGACGGCGAGCAATTCAACAAGATCTTGCGGTACGTCCAGTCCGGCGTTCGACAGCGG
 TGCCACCCTCGTCGCCGGCGGCGACAGGGTAGGCGACAGGGGCTTCTACATACAGCCGACGGTG
 TTTGCCGACGCCAAGGACGAAATGAAGATCGCTCGGGAGGAGATTCGGGGCCGGTGCAAACCA
 TTCTCAAGTTCAGCGGCGTGGAGGAGGTGATCCGGCGCGCAACCGCTGTGCGGGCGCTGCGGGCGGG
 GCGGGGGGTGTTACGCGGAGCCTGGACGCGGCCAACCCCTGTGCGGGCGCTGCGGGCGGG
 CACCGTGTGGGTGAACGTGCTACGACGTGTTTCGACGCCACCATCCCGTTCGCGGGCTACAAGATG
 AGCGGCGTGGGGCGGGAGAAGGGCATCTACGCCCTCCGCAACTACCTCCAGACAAAGGCCGTG
 TCACACCCATCAAGAACCCCGCATGGCTGTAATCACATCCTCCGTCTTGGCCGACGGCGCTG
 CGCCGTTTCTCGGAGAACGTGACGAATAAAACAAACGTTTGGTTAAAAAGACAAGGACGACGG
 AAAAAAAAAAAAAAAAAAAAAA

Skibbe et al., RF2B

Vasilou classification # ALDH2B6

protein (GB # AAL99613)

MAATVRRRAASSVLSRFLTKPSPSPASAAGNNSALLGSGAAALHRFSTAPASAAAAAEEP
 IQPAVEVKHTQLLINGNFVDAASGKTFPTLDPRTEVIARVAEGDSEDIDRAVAARRAFDEGPWPR
 MTAYDRCRVLLRFADLIERHAEVAALETWDNGKTLAQAGAEPVMVARCVRYAGWADKIHGLVA
 PADGAHHVQVLHEPVGAVAGQIIPWNFPLLMFAWKVGPALACGNTVVLKTAEQTPLSALYVANLLHE
 AGLPEGVLNVVSGFGPTAGAALSSHMGVDKLAFTGSTGTGQIVLELAARSNLKPVTLELGGKSPFIVM

Fig. 5, continued

DDADVDQAVELAHQAVFFNQGCCAGSRTFVHERVYDEFVEKSKARALKRVVGDPPFRDGVQGP
QIDGEQFNKILRYVQSGVDSGATLVAGGDRVGDRGFYIQPTVFADAKDEMKIAREEIFGPVQTILKF
SGVEEVIRANATPYGLAAGVFTRSLDAANTLSRALRAGTVWVNCYDVFDATIPFGGYKMSGVGRE
KGIYALRNYLQTKAVVTPIKNPAWL

Fig. 5, continued

Tobacco REF1 Homolog: mitochondrial ALDH

Skibbe et al., TobALDH2a
Vasilou classification # ALDH2B2

(GB # Y09876)

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1 ggttcttcaa ttattacag tgagaaactt tcatttgctc tactgttcat attaatggcg
  61 gctcgtgtgt ttacctctcg tctctctcgc tctttgacat cctcttctca tctgctctca
 121 agagggttga tcattgtgga taagcaaaaa tccatctcgg gcagaatagc tgcttatcaa
 181 tacagcaagg cggctgctat tgaggaaccg atcaaaccag ctgtcaatgt ggaacatact
 241 aaacttttta tcaatggoca attgttgat gctgcatcag gaaaaacatt cctacccct
 301 gacccaggga caggggaggt aattgcacat gttgctgaag gtgatgcaga agatattaat
 361 cgggcagtag ctgctgctcg taaggctttt gacgaaggac catggcctaa aatgaatgct
 421 tatgaaaggc caagatatc cgtacgcctt gctgatctga ttgaaaaaca taogatcaa
 481 attgcaagcg togagacttg ggatactggg aagccgtatg aacaggctgc taagattgaa
 541 gtaccaatgg ttgtacgtct actcgttat tatgctggct gggcagataa aattcatggt
 601 atgactattc ctgcagatgg accatatcat gttcagacat tgcacgaacc aattgggggt
 661 gctggtcaga ttatccatg gaactttctt cttctcatgt tttctggaa gattggacct
 721 gcttagctt gtgggaacac tgcgtgcta aagacagctg agcagacacc attatctgca
 781 ttctaogtag cacatctgtt acaggaggct gggctgctg aagggtttt gaacatcatt
 841 tctggtttg gtccaacagc tgggtctctt cttgtagtc atatgatgt cgataagctt
 901 gctttactg gatcgacaga tacaggaaaa gctatactt cactggctgc taagagcaat
 961 ctaagccgg tgactttgga acttgagggg aaatccctt ttattgttg tgaggatgct
1021 gatattgata cggccgttga acaagctcac ttgctctt tcttaatca ggggcaatgt
1081 tgctgtgctg gatctcggac tttgttcac gagaaagtt atgatgaatt tctgagaag
1141 gcaaaggcac gtgcctgaa acgaacagtt ggtgatcgt taaatcagg cactgagcag
1201 ggtcctcaga ttgattcaaa acagttgat aagatcatga attacattag atctggatc
1261 gatagtggag caactcttga aactggaggt gagcgactg gtgaacgggg atactatatt
1321 aagccacag ttttcttaa cgtaaggac gatagtctga ttgcacaaga tgaatattt
1381 ggtccagtgc agtccatctt aaaatttaag gatgttgatg atgtgatacg gagagctaat
1441 aacagtogg atgtgttagc tgctggagta ttacacaga acattgacac tgcaaacaca
1501 ttgacacgag ccttgagagt tggaaaggta tgggtaatt gcttgatac ctogatgct
1561 acaattcctt ttggtgggta taaatgagt ggacacggaa gagaaaagg agaatacagt
1621 ctcaagaatt actgcaagt aaaggcagtt gtaccccat tgaagaatoc tgcattgta
1681 taaacatgat cctctcagc aatttttaca aataaaacta tatcaagttg cttatttta
1741 tgatgctgat gacgattaag ttttggtttt cttaaaact tgcactata agcaaactgc
1801 aattaatttt aacaggcagc agggtttatt gaaagctgcc aaattgcaa atttgccatc
1861 cttccatcag cttttttta agattagtct tctgtttt tctactctc tgcaaggagt
1921 tgttctctt taaattttt attgctcaaa atatgctgcc tccgaatagt ttgggagtga
1981 ggcattgatt ttggtgtat tcattgtttt aaaatataaa gactagaaca aaaagaaaca
2041 ctaaggaatt ctatgtttac tattatgtt t

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maarvftsr lsrstsssh lsrqliivdk qkshlgriaa yqystaaaie epikpavnve
  61 htklfingqf vdaasgktp tdprrgevi ahvaegdaed inraaaaark afdegpwpkm
 121 nayerskifv rladliekhn dqlatletwd tgkpyeqaak levpmvvrll ryyagwadki
 181 hgmtipadgp yhvqthepi gvagqilpwn fpllmfswki gpalacgntv vlktaeqtpi
 241 safyvahllq eaglpegvln llsfgpftag aplcshmdvd klaftgstdt gkailsaak
 301 snlkpytlle ggkspfvce dadidaveq ahfalffnqg qccagstrf vhekvydefi
 361 ekakaralkr tvgdpfksq eqgpqidskq fdkimnyirs gidsgatlet ggerlgergy
 421 ylkptvsnv kddmliaqde ifgpvqsilk fkdvdvrr annsryglaa gvftqnidta

```

Fig. 5, continued

481 nttralrv twvncfdt datipfggyk msghgrekge yslknylqv avvtpiknpa
541 wl

Fig. 5, continued

Barley FER1 Homolog: cytosolic ALDH2

(tentative consensus sequences from several partial EST sequences - from TIGR)

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TTCGGCACGAGGAACACAACCTCCTTCCCCTCTCTCCACGTAGGCCAAGGGACGAAGCGAAGGGA
ACGGGCGACGTCGATGGCGGCAGCGAACGGCGGCCAGGGGTTTGAGGTGCCGGAAGTGGACAT
CAAGTTCACCAAGCTCTTCATCAATGGCCAGTTCTGTCGACGCAGCTTCAGGCAAGACGTTGAGA
CCCGGGACCCACGCACCGGCGAGGTGATCGCCAGGATCGCCGAGGGAGACAAGGCCGACATCGA
CCTCGCCGTGAAGGCCGCCCGCGACGCTTCGACAACGGCCCCCTGGCCCAGAATGCCCGGCTGC
GCAAGGGCAAGGATCCTGCACAAGTTCGCCGACCTGGTTCGACCAGCACGTGGAGGAGCTGGCGG
CGCTGGACACGTTGGACGCCGGAAGCTGTTCCAGATGGGCAAGCTGGTGGACATCCCCGGAGG
CGCCAACCTGCTCCGGTACTACGCCGGTGCC
GCCGACAAGATCCACGGCGAGACGCTCAAGATGGCGCGGCCGCTGCAC
GGGTACACGCTCAAGGAGCCCGTCGGCGTCGTGGGCCACATCGTGCCC
TGGAAC TACCCACCACCATGTTCTTCTTCAAGGTCAGCCCCGCGCTCG
CCGCCGGGTGCACCATGGTCGTCAAGCCGGCCGAGCAGACGCCCTCT
CCGCGCTCTTCTACGCTCACCTCGCCAAGGAGGCCGGGATCCCCGACG
GCGTCTTCAACGTCGTGCCCGGCTTTGGCCGACGGCCGGTGCGGCCAT
GGCTTCTCACATGGACATCGACAAGATCAGCTTCACGGGATCCACGGA
GGTCGGGCGGCTGGTCATGCAGGCGGCGGCCCTGAGCAACCTCAAGCC
CGTCTCGCTGGAGCTGGGGGGCAAGTCCCCGATCATCGTGTTTGACGA
CGCCGATGTTGACATGGCCGTGAGCCTCGTTAACATGGCCACCTACACC
AACAAAGGGCGAGATCTGCGTCGCTGGCACGCGCATATACGTGCAGGAA
GGGATCTACGACGCCTTTGTGAACAAGTCAGTGGAGCTTGCCAAGAAA
TCCGTGGTTCGGAGATCCTTTCAACCCGAACGTACATCAAGGTCCTCAGG
TTGACAAGAATCAATACGAGAAGGTCCTCAAGTACATCGACGTCGGTA
AGAGCGAAGGCGCCACCCTACTCACCGGAGGGAAGGCCTGCAGCGAC
AAGGGTTACTACATCGAGCCCGCCATCTTCACCGACGTCAAGGATGAC
ATGTCGATTGCGCAAGAGGAAATCTTCGGGCGCGGTGATGGCTCTCATG
AAATTCAAGACAATGGAGGAGGTGATTGAGAAGGCGAACAGCACCCG
CTATGGCCTGGCCGCCCGGCGTGGTGACCAAGAACATCGACACCATGAA
CACCGTGTGCGGGTCGGTCAGGTCCGGGGTTCGTCTGGGTAACTGCTAC
TTCGCCTTCGACCCGGACGCCCCGTTTCGGCGGCTGCAAGATGAGCGGC
TTCGGCAAGGACATGGGCACGGATGCCCTCGACAAGTACCTGCACACC
AAGACGGTGGTCACTCCACTCTACAACACGCCCTGGTTGTGATCTGGAC
GGACATCCGATCGAAACGCATGGGGAAAGATTTCTAGTTATATATAA
TATTTATACAGCTGGATGCTTTCAGGTTACTTCTGCAGTTGTAATTATTA
CTTGTGGTCAATCTTTTCGTGGTATT

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Protein (67.5% identical to At REF1)

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Maaanggggfevpeldikftklfingqfvdaasgktfetrdprtgeviariaegd
kadidlavkaardafdnpgwprmpgcararilhkfadlvdqhveelaaltdvdag
klfqmgklvdipgganllryyagaadkihetlkmaphlhytlkepvvgvghiv

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Fig. 5, continued

pwnypttmfffkvspalaagctmvvkpaeqtplsalfyahlakeagipdgvlv
pgfgptagaamashmdidkisftgstevgrlvmqaaalsnlkpvslelggkspii
vfddadvdmavslvnmattytnkgeicvagtriyvqegiydafvnksvelakksv
gdpfnpnvhqgpqvdknqyekvlkyidvgksegatlltggkacsdkgyyiepaif
tdvkddmsiaqeeifgpvmalmkfktmeeviqkanstryglaagvvtknidtmnt
vsrsvrsgvvwvncyfafdpdapfggckmsgfgkdmgtaldkylhtktvvtply
ntpwl

Fig. 5, continued

Barley REF1 Homolog: Mitochondrial ALDH2

(TC 56519)

CGGCACGAGGCACCATCACTGCTCCTCAGCACTCTTTCCCCCTCCGCGCAGCTGGGGACGCCCTA
 CCATTTACTACTGAGCCTCTGAACCCGGAGGACGAGAAGAATTGATTGCTGATCCGGCCGCAAACC
 AACAGATTCTTCTGCTCCGCGAGATCATCATGCTGCTGCCGCCAGAGGAGGGCCGCC
 TCCTCGCTCGTCTCCCGTGCCTGCTCTCCAGGCCCGCAGCTTCCCCCGCCGCTGTCCCTCTGC
 GCTCCGCAGGGCAGATGGGGCAGCTGGATTGTTGCTGGACTCCTTCAGAGGTTCCGGCACTGCA
 GCAGCAGCAGAGGAACCCATCTCGCCTTCTGTCCAAGTGGGCGAGACACAGCTCCTCATCAACGG
 CAAATTCGTTGATGCTGCATCTGGCAAGACTTCCCGACTCTGGACCCCTCGACCGGGGAGGTGA
 TTGCCCGTGTGTCTGAAGGAGATGCCGAAGATGTTGACCGTGCAGTTGTTGCGGCCCGCAAGGC
 ATTCGATGAAGGGCCATGGCCAAAGATGACTGCCTATGAGAGGTCCCGGATTCTTTTGCGATTTG
 CTGATTTGATAGAGAAACACAATGATGAAATTGCTGCACTGGAGACGTGGGACAACGGGAAGCC
 CTATGAGCAAGCTGCCACATCGAAGTGCCAATGCTTGCTCGGCTTATGCGGTACTATGCAGGCT
 GGACTGACAAGATCCATGGCCTCATCGTACCGGCTGATGGCCCGCACCATGTACAGGTGCTGCAT
 GAGCCGATTGGTGTGCTGGGTGAGATCATCCCGTGGAACTTCCCACTTTTGATGTATGGCTGGA
 AAGTTGGCCCTGCTTTGGCCTGTGGGAACACTATTGTTCTCAAGACCGCTGAACAAACCTCTTA
 TCTGCCCTCTATGTTTCTAAGCTGTTGCATGAGGCTGGACTACCCGAAGGTGTCCTGAACATCAT
 ATCTGGTTTTGGTCTACCGCTGGGGCTGCTCTTGCTGGCCACATGGACGTTGACAAGATTGCAT
 TCAC
 TGGATCAACCGATACTGGGAAAGTTATTCTTGAGTTATCTGCACGGAGCAATCTTAAGGCAGTGA
 CACTGGAGCTAGGAGGCAAGTCTCCTTTTATCGTCATGGATGATGCAGATATTGACCAAGCTGTT
 GAGCTTGCGCATTTTGCGCTGTTTTTCAACCAGGGGCAATGCTGCTGCGCTGGGTCTCGCACGT
 TCGTACATGAGCGTGTTTATGATGAGTTTGTGAGAAGTCAAAGGCTCGTGCTTTGAAGCGTGTA
 GTTGGTGATCCATTACAGGAAAGGTGTTGAGCAGGGTCCTCAGATTGATGATGAGCAATTCAAGA
 AGATCTTGCGCTACATTAAGTCGGGTGTGCAGAGTGGAGCCACCCTTGTGACGGGTGGTGACAA
 GTTGGGTGACAAAGGTTACTACATCCAGCCAACAATTTTCTCAGATGTGCAGGATGACATGAAGA
 TAGCCAGGAGGAGATATTCGGGCCTGTTCAAGTCAATCTTCAAGTTCAATGACCTCAACGAGGTG
 ATCAAGAGGGCGAACGCAAGCCAGTACGGATTGGCCGCCGGCGTTTTTACCAACAACCTGGACA
 CGGCCAACACCTTTGACGCGTGCCCTCAGGGCCGGCACGATCTGGGTGAACTGCTTTGACATCTTC
 GATGCCGCGATCCCCCTTCGGCGGGTACAAGATGAGCGGCATCGGTAGGGAGAAGGGCATCGACA
 GCCTGAAGAACTACCTGCAAGTCAAGGCGGTGCTCACCGCGCTTAAGAACCTGCGTGTTGTG
 AGCATAGCACACCTATGGTCTTCTGAGTCTGAGATACCGGACAACGTGAAGACGCAGGGACAATT
 GGATGAGAAAAAAGAAGATGATGATGATAACAACGATGAGGATCTCTAATAAGCCATTCTTCA
 TGGGCAGCCAGCCACCGTCTCTAATTAGTATCATATGTGATTTGGTTTCCTTTGTCAACCGCGGC
 AAGACATATATGTTGTATGTTGTAGCAACATTATGTTGATTATAGCTTGTGGAAAAATTCTCTG
 GTTGCAAGTTAATCAACTCTTTTGATCAGTTGTTGTTCTGCGACACATATGAAGCTAATGGTGT
 TCCTATCCTAGTTAATCCATGTCTTGTGATCATCAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA
 AAAAAA

Protein

Maaaatrraasslvsrdlsrpaaspaavpsalrradgargllpgllqrfgtaaaaeepispsvqvgetqllingkfvdasgktfptl
 dprtgviarvsegdaedvdravvaarkafdegwpwpmktayersrillrfadllekhndelaaletdngkpyeqaahievpm
 larlmryyagwtdkihlivpadgphhvqvlhepivvgqilpwnfpplmygwkvgalacgntivlktaeqtpisalyvskllhe
 aglpegvlniisgfgptagaalaghmdvdkiatgstdtgkvilelsarsnlkavtleggkspfvmdadidqavelahfalfnq
 gqccagstrfvhervydefvekskaralkrvvgdprfkqveqgpqiddedqfkilryiksgvdsगतivtgdklkdgyylqpt
 ifsdvqddmklaqeelfgpvqsifkfnlnevikranasqyglagvftnnldtantlralragtiwvncfdifdaalpfggykms
 girekgidslknylqvkvavtalknpawl

Fig. 5, continued**Medicago trunculata cytosolic ALDH**

(tentative consensus sequences from several partial EST sequences - from TIGR)

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CCCATTTCTTTGAAATCTACCATTTCTTTCAAGTTGTCTGTGACTTGACTCTGGTTTCTTTGGGA
AACACACAAAGATG
ACTCTACCTTCTTCCAATGGCAAGACTAATCTCTCTCTAGAGATTCCCACCATCAAGTTCACCAA
CTCTTCATCAATGG
AGAATTTGTTGATTCCCTTTTCAGGAAAAGAGTTTGAGACAATAGATCCAAGAAGTGGAGAGGTGA
TAGCAAAAATTGCAG
AGGGAACGAAAGAAGACATTGATGTTGCTGTAAAAGCGGCACGTGTGCTTTTCGATGATGGTCC
ATGGCCTCGTATGCCC
GGTTTTGTAAGAGCAAAAATAATGCTGAAATGGGCAGACTTAATTGATCAAAACATAGAAGAAAT
AGCAGCATTAGATAC
AATAGATGCTGGAAAATACTATACACTTTCTGCAAAGCTGTTGACATTCTGGAGTAGCAAATATAA
TACGTTACCTATGCC
GGTGCTGCGGATAAAATTCACGGCAAGGTTTTAAACCTGCTCGGGAGTTGCACGCATATACTTT
GATGGAGCCAATCGG
TGTCGTTGGACACATTATTCCTTGGAATTTTCCTAGTACTATGTTTGCTGCTAAGGTTGCTCCTG
CTTTGGCTGCTGGTT
GTACTATGGTTCTTAAGCCTGCTGAACAAACACCTCTCTGCTTTGTTTTATGCTCATCTTGCTA
AGGAGGCTGGAATT
CCAGATGGAGTGCTCAATGTAGTACCTGGATTTGGTGCAACTGCAGGAGCTGCAATAAGCTCACA
CATGGACATTGATAA
GGTTAGTTTTACCGGTTCAACAGAAGTAGGACGCGAAATAATGGTATCTGCAGCTAGAAGTAATT
TGAAACCAAGTTTCAC
TTGAATTAGGAGGAAAATCACCCCTCTTAATTTTTGATGATGCTGATGTTAATAAAGCTGCTGAA
CTTGCTCTCCTTGGC
ATTTTATTTAATAAGGGAGAAATTTGTGTTGCGGGTCTCGTGTGTTTGTTCAAGAAGGAATCTA
TGATGAATTTGAGAA
GAAGTTGGTGGAGAAAGCAAAAGCTTGGGTTGTTGGTGATCCTTTTGATCCTAAAGTTCAACAAG
GGCCTCAGGTTGACA
AGAAGCAATTTGAAAAAATTCTTTCCTACATTGAGCATGGAAAGAATGATGGCGCAACCCTTTTG
ACAGGTGGTAAAAAA
ATTGGAGACAAGGGTTACTACATTGAGCCTACAATTTCTCAAATGTTAAGGAGGACATGCGTAT
AGCACAAGATGAAAT
ATTTGGCCCTGTGATGGCACTCATGAAGTTCAAGACTATTGAGGAAGCAATCAAAAGTGCAAACA
ATACAAAATATGGCT
TAGCAGCAGGAATTGTGACAAAGAATTTGGATATAGCAAACACTGTGTCAAGGTCCATTAGAGCA
GGAATTATTTGGATT
AATTGCTACTTTGCCTTTGGAAATGATATTCCTTATGGAGGTTACAAGATGAGTGGGTTTGGAA
AGATTTTGGATTGGA
ATCATTACATAAATATTTGCAAGTTAAATCTGTTGTAACCTCCATTTACAATTCTCCTTGGCTTTG
AATGTTCTTTGTAT
TTGGGTTATGTGATTTGAGAGTGAACAAATGGACCTTTTCATGTATAATTCATCATAATAATAA
CATTATAAGATCTT
ATGTTATGTTACATCCAATC

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Protein (72 % identical to At REF1)

Fig. 5, continued

MTLPSSNGKTNLSLEIPTIKFTKLFINGEFVDSLSGKEFETIDPRSGEVIAKIAEGTKED
IDVAVKAARVAFDDGPWPRMPGFVRAKIMLKWADLIDQNEEIAALDTIDAGKLYTFCKA
VDIPGVANIIRYLAGAADKIHGKVLKPARELHAYTLMETIGVVGHIPWNFPSTMFAAKV
APALAAGCTMVLKPAEQTPLSALFYAHLAKEAGIPDGVLNVVPGFGATAGAAISSHMDID
KVSFTGSTEVGREIMVSAARSNLKPVSLELGGKSPLLIFDDADVNKAAELALLGILFNKG
EICVAGSRVVFQEGIIYDEFKKLVEKAKAWVVGDPDPKVQQGPQVDKKQFEKILSYIEH
GKNDGATLLTGGKKIGDKGYIEPTIFSNVKEDMRJAQDEIFGPVMALMKFKTIEEAIKS
ANNTKYGLAAGIVTKNLDIANTVSRIRAGIWINCYFAFGNDIPYGGYKMSGFGRDFGL
ESLHKYLQVKSIVTPIYNPWL

Fig. 5, continued**Medicago tunculata REF1 Homolog: cytosolic ALDH2**

(tentative consensus sequences from several partial EST sequences
- from TIGR)

ATGACTGGCCAGTTAATGGCGAACCCACCATCAAGTTCACCAAGTTATTCATCGATGGA
GATTTTGTGGATTTCGTTACAGGCAAGACATTTGAAACAATAGATCCAAGAACAGGAGAA
GTTATAGCAAGGATCAGCGAAGGAACCAAAGAAGACATTGATGTTGCTGTAAAGGCAGCT
CGTTATGCATTTGACTTTGGTCCTTGGCCCCGCTGCCTGGTGTGAAAGAGCAAACTT
ATGATGAAATTTGCGGACCTAATTGATGAAAAATAGAAAGAGCTAGCAGCACTTGATGCC
ATTGATGCAGGAAAGTTGTACCATATGTGTAAGGCTCTTGACATTCCTCAGCAGCAAAT
ACACTTCGTTACTATGCAGGTGCAGCTGATAAAATTCATGGAGAGGTATTAAAAGTTGCA
AGAGAGTTCCATGCTTATACATTGATGGAACCAATTGGTGTGATGGACACATTATTCCT
TGGAACTTTCCACTTCCCTGTTCTTGTCAAGGGTAGCCCTGCTTAACTGCTGGGTGC
ACCATGGTCGTCAAACCTGCTGAGCAAACACCTCTATCTGCTTTGTTTTATGCTCATCTA
GCTAAATTGGCTGGAATCCAGATGGAGTGATCAATGTAGTACCCGGATTTGGAGCTACT
GCTGGTGCTGCAGTGAGCTCACACATGGACATTGATGCGTTAGCTTTACTGGTTCAACA
CAAACCTGGGCGTGAGATAATGCAAGCTGCAGCTAAGAGTAACCTGAAACATGTTTCATT
GAATTAGGAGGCAAGTCAACCCCTCATAATTTGATGATGCTGATATTGACAAAGCTACT
GAACCTGCTCTATTAGGCATCCTATTTAACAAGGGGAGAAGTGTGTGTTGCAAGTTCACGT
GTGTTTGTCAAGAAGGGATCTATGATGAATTTGAGAAAAAATTGGTAGAAAAGGCTAAA
ACTTGGGTCATTGGAGACCCATTTGATCCTAAAGTTCAGCAAGGACCTCAAGTTGACAAG
AAACAATTTGAAAAAGTTCTTTCATATATAGAGCATGGGAAGAAAGAAGGAGCTACCTT
TTGACTGGGGGTAAAACAGTGGGAAACAAAGGATACTATATTGAACCAACAATTTCTCC
AATATAAAGGATGATATGGTTATAGCACAGGATGAAATATTTGGTCCTGTGATGGCACTG
AAGAAGTTTAAGACTATTGAGGAAGCAATTAAGAGTGCTAATAATACAAGATATGGACTA
GCAGCAGGTATTGTGACAAAGAATTTGGATATTGCAAACACAGTGTCAAGATCCATTCTGT
GCAGGCACTATTTGGATAAACTGTTATTTTGGCTTTTGGAGATGATATTCCTTTTGGAGGA
TATAAATGAGTGGATTTGGAAGAGATTATGGATTAGAAGCCCTTCACAAGTATCTACAA
GTAAATCTGTTGTTACTCCCATTTATAATTCTCCCTGGCTCTA

Protein (72 % identical to At REF1)

MTGPNVNGEPTIKFTKLFIDGDFVDSVTGKTFETIDPRTGEVIARISEGTKEDIDVAVKAA
RYAFDFGPWPRLPGAERAKLMMKFADLIDENIEELAALDAIDAGKLYHMCKALDIPSAAN
TLRYAGAADKIHGEVLKVAREFHAYTLMPIGVDGHIIPWNFPSTLFFVKGSPCLTAGC
TMVVKPAEQTPLSALFYAHLAKLAGIPDGVINVPFGFATAGAAVSSHMDIDAVSFTGST
QTGREIMQAAAKSNLKHVSLELGGKSPLIIFDDADIDKATELALLGILFNKGEVCVASSR
VFVQEGYDEFKKLVEKAKTWIGDPDPKVQGPQVDKKQFEKVLSTYIEHGKKEGATL
LTGGKTVGNKGYIETIFSNIKDDMVIAQDEIFGPMALKKFKTIEEAIKSANNTRYGL
AAGIVTKNLDIANTVRSIRAGTIWENCYAFGDDIPFGGYKMSGFGRDYGLEALHKYLQ
VKSVVTPINSPWL

Fig. 5, continued**Medicago trunculata cytosolic ALDH2**

(tentative consensus sequences from several partial EST sequences - from TIGR)

ATGACTGATCTTAACTCCAGTAATGGGGACAACAGCTCCTTGTTCAAAATGCCGACCATC
 AAGTATAACAAGCTCTTCATCAATGGAGATTTTGTGATTCTGTATCAGGAAGCACATTT
 GAAACAATAGACCCAAGAACAGGAGATGTGATTGCAAGAATAAGTGAAGGAGCAAAAGAA
 GACATTGAAATTGCAGTTAAAGCAGCACGTGAAGCATTTGATTGAGGTCCATGGCCCCGG
 ATGTCTGGTGTGAACGTGCGAAAATAATGATGAAATTTGCAGAACTAATTGATGAAAAC
 ATAGAAGAACTAGCAACATTAGATGCAATTGATGCTGGCAAGGTGTACTTTATCAACAAG
 GCTTTTGAAATTCCTTCAGCAGCAAAATACACTACGTTACTATGCAGGTGCTGCTGATAAA
 ATTCATGGTGAGGTATTTAAATCTTCTGGCCAATTCATGCATACACACTGATGGAACCA
 ATTGGTGTGTGGGACACATCATTCCATGGAATGCTCCCACTATGGTTTTCTTCACCAA
 GTTAGCCCTTCCTTAGCTGCTGGGTGCACCATGGTTCTCAAACCTGCTGAACAAACACCT
 CTTTCTGCTTTGTTTTATGCCATCTAGCTAAGCTGGCTGGGATCCCAATGGAGTGCTG
 AATGTAGTACCCGGATTTGGTCCAACCTGCTGGTGCTGCAATCAGCTCACACATGGACATA
 GATGTTGTCAGCTTTACTGGTTCAGTTGAAGTAGGCCGTGAAATAATGCAAGCTGCAGT
 AAGAGTAATTTAAACATGTTTCACTTGAATTAGGAGGCAAGTCACCTCTCATAATTTTC
 GATGATGCAACATAGACAAAGCTGTTGAGCTAGCTCTTTTGGGTATCCTAGCTAACAAG
 GGAGAAATTTGCGTTGCATGTTCCCGTGTGTTTGTTCAGGAAGGGATCTACGATCAAGTA
 GAGAAGAAGTTGGTGGAGAAGGCAAAAGCCTGGGTGATTGGAGATCCTTTTGATCCTAAA
 ACTCAACAAGGACCTCAGGCTGATAGGAACCAATTCGAAAAAATCATTTCTATATTGAG
 CATGGAAAGAGAGAAGGAGCTACACTCTTGACTGGAGGTAGAAGAGTGGGCAGTCAGGGC
 TACTACATTGAACCTACAATTTCTCCAATGTAAAGGAGGACATGCTTATAGCACAGGAT
 GAAATATTTGGCCCTGTGATGGCACTAATGAAGTTCAAGACTATTGAGGAAGCCATTAAG
 AGTGCCAACAATACCAGATATGGCCTAGCAGCAGGCATTGTGACCAAGAACTTGGATATT
 GCAAACACTGTTTCAAGGTCCATCCGTGCAGGCATTATTTGGATCAACTCTTATCTTGCC
 GTGGGAAGTGACATTCTTTTGGAGGATATAAAATGAGTGGATTTGGAAGAGATCAGGGA
 TTAGAAGCTCTTACAAGTACTTACAAGTTAAATCCATTGTAACACCTATTTACAATTCT
 CCCTGGCTTTG

Protein (69 % identical to At REF1)

MTDLNSSNGDNSSLFKMPTIKYNKLFINGDFVDSVSGSTFETIDPRTGDVIARISEGAKE
 DIEIAVKAAREAFDSGPWPRMSGVERAKIMMKFAELIDENIEELATLDAIDAGKVYFINK
 AFEIPSAANTLRYAGAADKIHGEVLKSSGQFHAYTLMPIGVVGHIIIPWNPMTMVFFTK
 VPSLAAGCTMVLKPAEQTPLSALFYAHLAKLAGIPNGVLNVVPGFGPTAGAAISSHMDI
 DVVSFTGSVEVGREIMQAAAKSNLKHVSLELGGKSPLIFDDANIDKAVELALLGILANK
 GEICVACSRVVFVQEGIDQVEKKLVEKAKAWVIGDPDPKTQQGPQADRNQFEKIIISYIE
 HGKREGATLLTGGRRVGSQGYIEPTIFSNVKEDMLIAQDEIFGPVMMALMKFKTIEEAIK
 SANNTYGLAAGIVTKNLDIANTVSRIRAGIWINSYLAVGSDIPFGGYKMSGFGRDQG
 LEALHKYLQVKSIVTPIYNPWL

Fig. 5, continued**Soybean REF1 Homolog**

(Tentative consensus sequence from several EST clones from TIGR (TC133164))

GGCACGAGGCGCCAGCGTCTCTACGACAATCTCCTTCTCTCTAACTCATAACTCAGATGAGTGC
 CCTCTCTCTAACTCCAGTAGTAGCCACGGCAATTCCTTCTCAAGATGCCCCCATCAAGTTTACC
 AAGCTCTTCATCAATGGAGATTTTCGTTGATTCCATATCAGGAAGGACATTTGAGACTATAGACCC
 CAGAAAAGAAGAGGTAATTGCAAGAGTTAGTGAGGGAGATAAAGAAGACATTGATATTGCTGTT
 AAAGCAGCACGTCAGGCATTTGACTCGGGTCCATGGCCTCGCTTGCCAGGCTCTGAAAGGGCAA
 AAATTATGATGAAATGGGCAGACCTAGTTGATGAAAATATAGAAGAACTAGCAGCATTAGATACC
 ATTGATGCTGGAAAGCTATACTATATTAATAAGGTAGCGGAAATTCCTTCAGCTACAAATGCGTT
 ACGGTACTATGCAGGTGCTGCTGATAAAATTCACGGTGACGTATTAATAATGAACGGGGATTCC
 ATGCATATACACTTTTGGAAACCAATTGGTGTGTGGGACAC
 ATAATTCCATGGAATGCCCCAGCCTCTCATTTTTCATCAAGGTTAGCCCTTCCTTAGCTGCAGGC
 TGTACTATGGTCTCAACCTGCTGAACAAACACCCCTCTCTGCGTGGTGTATGCTCATATAACT
 AAGGTGGCTGGAATCCCAGATGGTGTGCTTAATATAGTACCTGGATTTGGCCCACTGCTGGCG
 CAGCAATAAGCTCACACATGGACATAGATGCGGTCAGTTTTACTGGTTCAATTGAAGTAGGGCGT
 GAAGTGATGCAGGCTGCAGCTAGGAGCAATTTAAACCAGTTTCACTTGAATTAGGAGGCAAGTC
 TCCTCTCATTATTTTCAATGACGCGGATATAGACAAAGCTGCCAGCTTGCTCTCTTTGGCATCAT
 GTCTAACAAGGGAGAAATTTGTGTGGCAAGTTCTCGGGTGTGTGTCAGGAAGAGATCTATGAT
 GAATTTGAGAAGAAGTTGGTGGAGAAGGCAAAATCTTGGGTGCTTGGGGATCCTTTTGTATCCA
 AATCCCTGCAAGGGCCTCAGGCTGACAGGAACCAATTGGAGAAAATACTCTCTATATTGAACAC
 GGAAAGAGAGAAGGAGCTACCCTTTTGACCGGAGGTAATACAGTGGGCAACAAAGGTTACTACA
 TAGAACCTACAATTTCTGTAATGTAAGGAGGACATGCTTATAGCACGAGATGAAATATTTGGC
 CCTGTACTAGCGCTGATGAAATTTAAGACCATGGAGGAAGCAATTAAGTGCTAACAACACCAA
 GTATGGCCTAGCAGCAGGAATTGTGACCAAGAATTTGGATACTGCAAAACACTATGTCAAGGTCCA
 TTCGTGCAGGCATTGTTTGGATCAACTGCTATTTAACCAGTAGGGAGTGACGTTCTTTTGGAGGG
 TATAAGATGAGTGGATTTGGAAGAGATTTGGGATTGCAGGCCCTTCATAAGTACTTACAAGTTAA
 ATCTGTTGTAACACCTATTACAATTCTCCTTGGCTTTGAATAATTGAATGTCTCTACATGAGCA
 CATATGCGTGTCTCTCTCATTTGAAATAAATTACACTTTATTTCTTATGATGTATGACTTAAAA
 ATACTTAGTCTCTTGTATTATGAGTTCTTTGTTTTATTACAACGTTGTTAACTT

Protein (TC133164) (70% identity with REF1 at amino acid level)

mppikftklfingdfvdsisgrtfetidprkeeviarvsegdkedidiavkaarqafdsqpwprlpgseraki
 mmkwadlvdenieelaalddidagklyyinkvaeipsatnalryyagaadkihgdvlkmngdfhaytle
 pigvvghilpwnapslsffikvpspslaagctmvlkpaeqtplsawcyahitkvaglpdgvlnivpgfgpta
 gaaishmdidavsftgsievgrevmqaaarsnlkpvslelgkspilifndadidkaaqlalfgimsnkg
 eicvassrvfvqeeydefekklivekakswwvgdpdpkslqgpqadrnqlekilsyiehgkregatiltgg
 ntvgnkgyyleptifcnvkedmliardeifgpvlalmkftmeealksanntkyglaagivtknldtanm
 srsiragivwincyltvgsdvpfggykmsgfgrdlglqalhkyqlvksvvtphnspwl

Fig. 5, continued

Wheat REF1 Homolog: cytoplasmic ALDH2

(TC71803)

tcggcacgaggctcactcattctctccaccgaggccaagggaagggaacgagctgaacggggcgatggcgatggcgagcg
aaccggcgccaaggggtttgaggtgocggaactggacatcaagttaccaagctctcatcaatggccagttcgtacgcg
ttccggcaagacgttcgagacccgggaaccaacgcaacggcgaggtgatcccaagatccgaggggagacaaggccgaca
tcgacctcgccgtgaaggccgcccgcgaggccttcgacaacggcccatggccagaatgccggctgtgaaggggcccgat
catgcacagggttcgagcctgttggaacgacgctgagggagctggcgcgctggacacggtggaacgggaagctatt
cctgatgggtaagatgatggacatccccggaggcgccaacctgctccgctactacgcccgcgcccgcgacaagatccacggc
gagacgctcaagatggcgcgcccgtccacggtacacgctcaaggagcccgctcgctgtgggccaatcgtgccatgga
actaccccaccacatgttcttctcaagggtcagccccgcgctcgccggctgcaacctggtcgtcaagcccgcgagcaga
cgcccctctccgctcttctacgcccacctcgccaaggaggccgcatcccgaacggcggttctcaacgtcgtgcccgtattg
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tpgl

Wheat REF1 Homolog: mitochondrial ALDH2

[illegible]

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Fig. 6

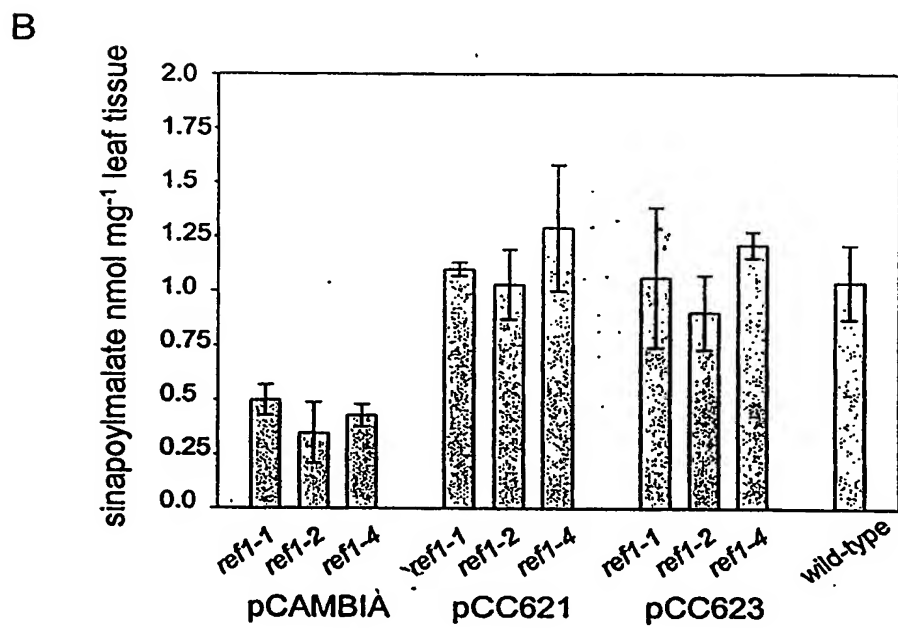
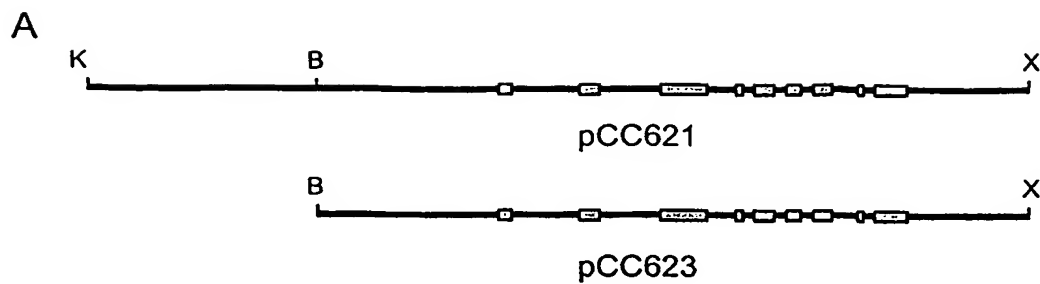


Fig. 7

